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B8H HQG HQH

(56) Documents Cited

GB 1579430 A

GB 1575458 A

GB 1571190 A

GB 1425888 A

US 5231934 A

(58) Field of Search

UK CL (Edition N ) B8H HLC HQG HQH HQJ

INT CL<sup>6</sup> B65D

(54) A pallet

(57) A pallet comprises a rectangular deck 3 of chipboard, timber planks or plastics material having hexagonally or heptagonally shaped feet 5 at or adjacent its four corners. The feet 5 are long and narrow and are arranged to extend at an acute angle to the adjacent peripheral edges of the deck, preferably along the diagonals of the deck. The deck 3 may have engagement means (19, Fig 5) for releasably engaging complementary engagement means (17) on the feet 5 at one or more angles to a peripheral edge of the deck 3 thus allowing the feet to be replaceable. The pallet provides open entry for fork-lift trucks from eight directions and can be readily placed on racks having different spacings. Stringers 11 may be provided.

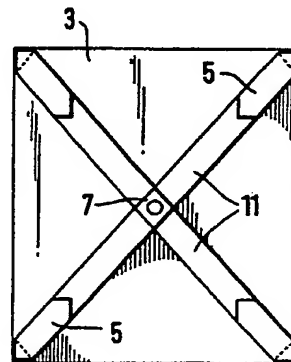


Fig. 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy. The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995. This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995.

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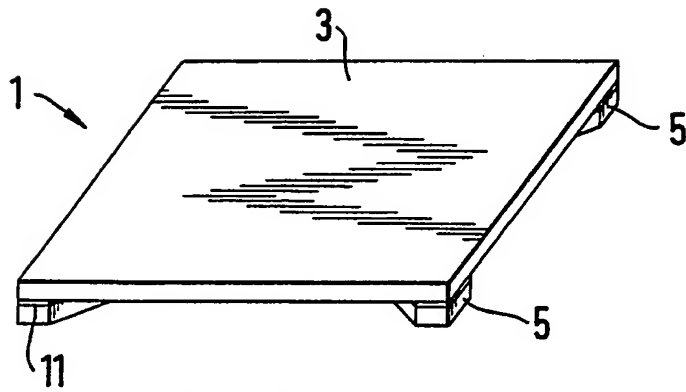


Fig. 1

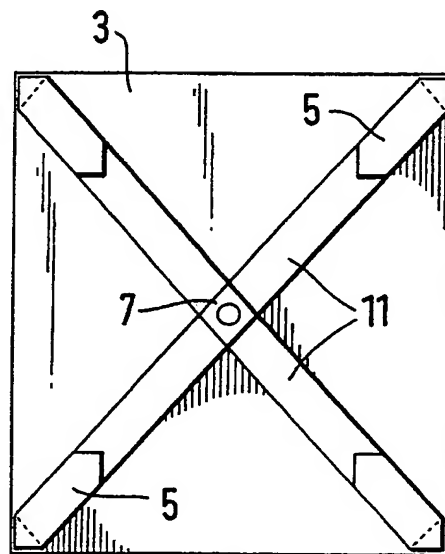


Fig. 2

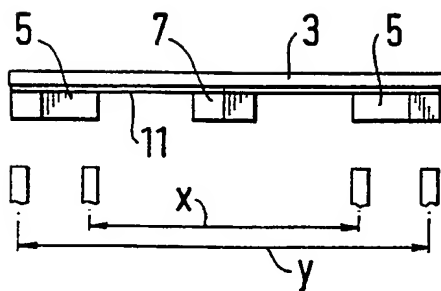


Fig. 3

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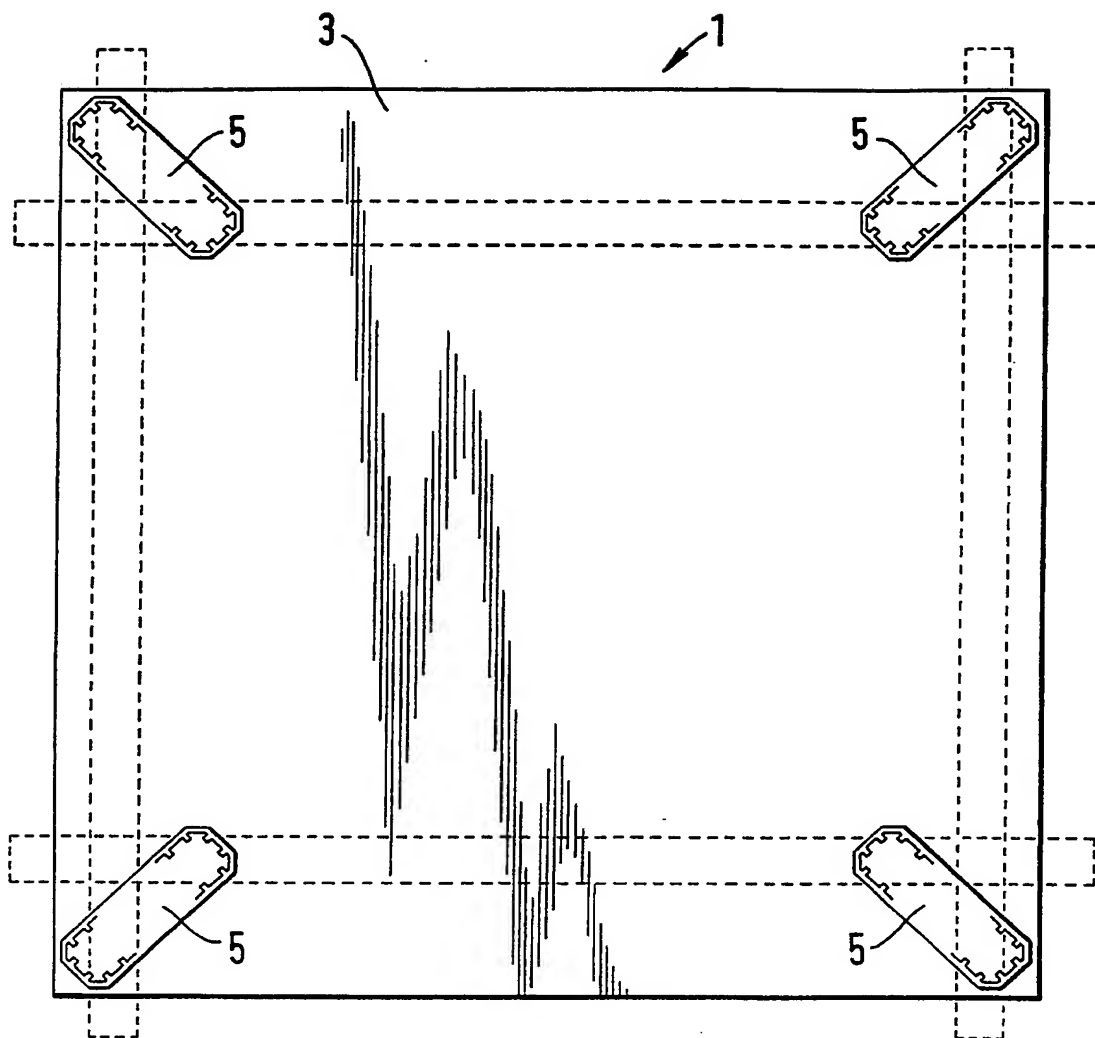


Fig. 4

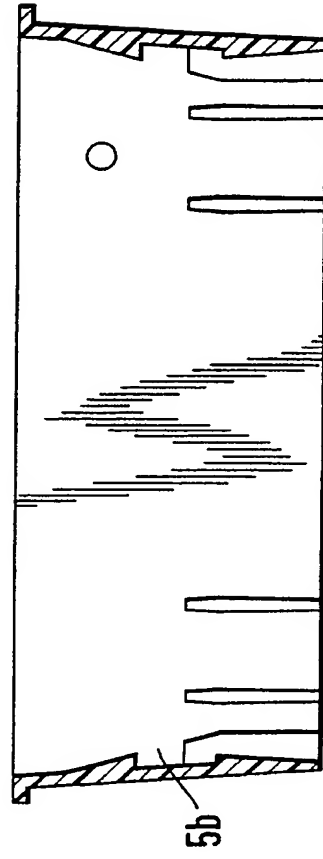
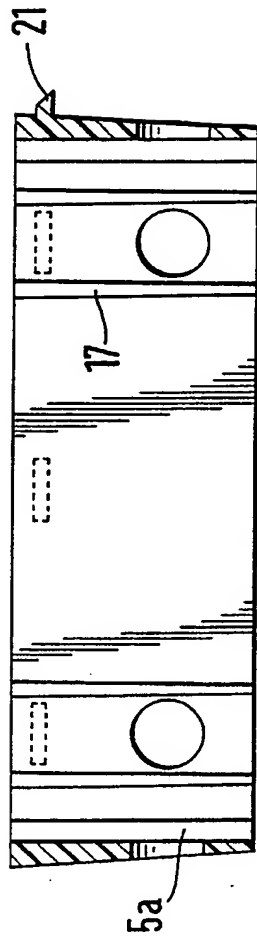
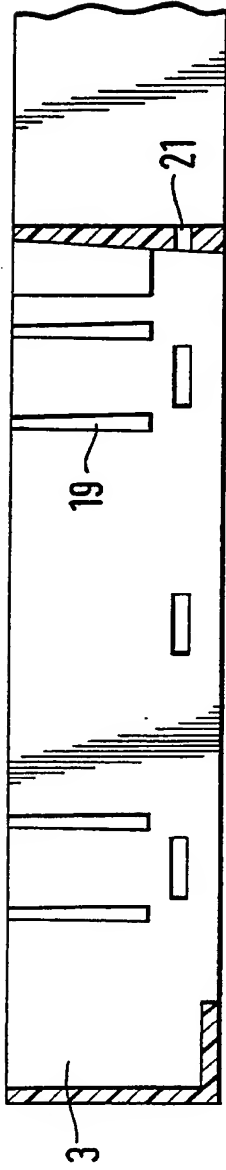


Fig. 5

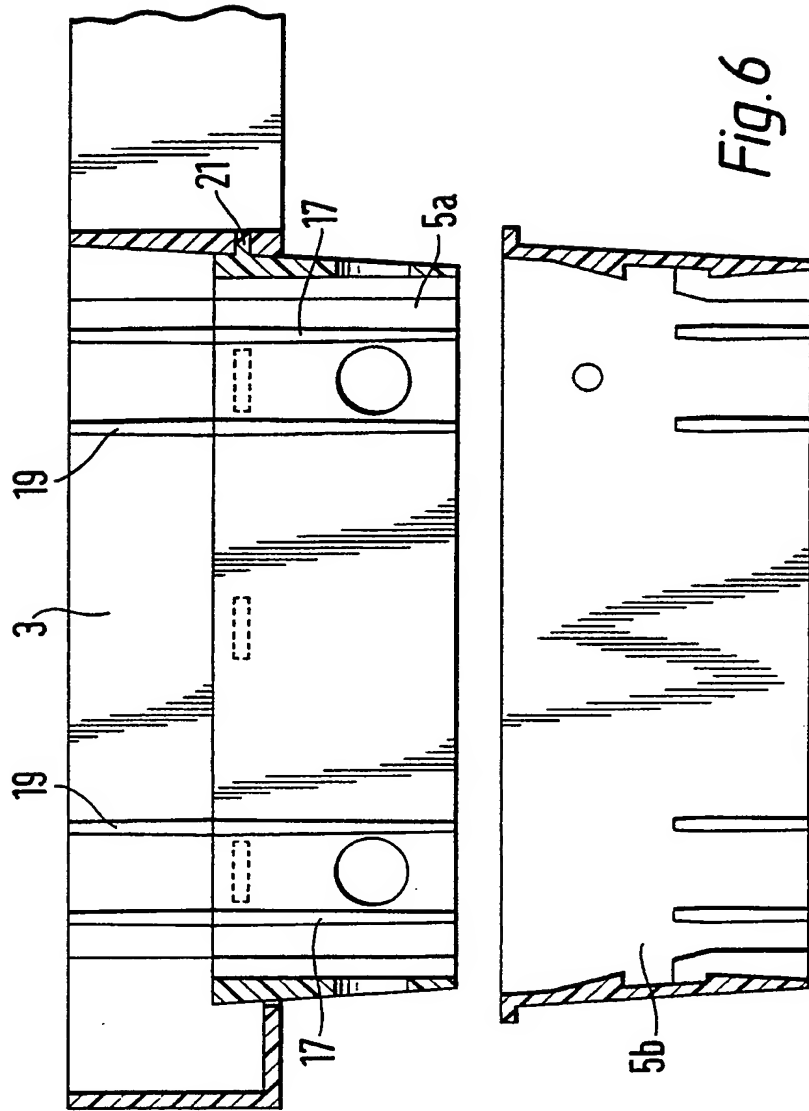


Fig. 6

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A PALLET

5 The present invention relates to a pallet of the type which provides a platform for stacking goods which may then be lifted using a fork-lift truck.

10 Conventionally, pallets are made of timber. There are many types but the so-called 'four-way' pallet (i.e. a pallet which may be engaged by a fork-lift truck from four directions) comprises upper and lower parallel boards formed from planks of timber with corner blocks and central blocks between the boards and spaced across the board area to provide support when the pallet is loaded. The spaces between the corner and centre blocks provide openings for access by the forks of a fork-lift truck so that the loaded pallet can readily be moved.

15 However, conventional pallets are expensive because of the amount of timber used and the labour costs necessary for assembling the large number of component parts.

20 It would therefore be desirable to provide a pallet which has fewer component parts and is formed from cheaper materials than the prior art timber pallets but which has similar strength, is readily moveable using a fork-lift truck and can be placed on racks of all sizes.

25 Accordingly, the present invention provides a pallet comprising a deck having foot means secured to its underside at or immediately adjacent each of its corners wherein each foot means has a length longer than its width and the length extends at an acute angle to the adjacent peripheral edges of the deck.

30 In one embodiment the deck is a one piece high density particle board. Alternatively, the deck can be formed from conventional timber planks. In another embodiment the deck is formed from a polymeric or plastics material.

35 Preferably the angle of the length of each foot means to the respective edges of the deck is such that the pallet can be lifted by a fork-lift

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truck having a tine on either side of a foot means.

Typically the length of each foot means is angled to one peripheral edge of the deck at an angle within the range of 10 to 45 degrees.

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For additional support, the pallet can include a central block secured to the underside of the deck.

10 In the preferred embodiments the deck is rectangular and the length of each foot means extends diagonally.

Optionally, strip-like baseboards are provided secured to the underside of the foot means and extending between a pair of foot means at diagonally opposite corners.

15

In order to strengthen the deck, stringers can be secured to the underside of the deck, between the foot means and the deck, and extending between a pair of foot means at diagonally opposite corners.

20 In the preferred embodiments, each foot means is a single block having a chamfered or tapered end.

Alternatively, each foot means may comprise two or more blocks.

25 Further features and advantages of the present invention will be apparent from the following description and accompanying claims.

Preferred embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings in which:  
30

Figure 1 is a perspective view of a pallet forming a first embodiment of the present invention;

35 Figure 2 is a plan view of the underside of the pallet of Figure 1;

Figure 3 is an end view of the pallet of Figure 1:

Figure 4 is a plan view of the underside of a pallet forming a second embodiment of the present invention.

5

Figure 5 is an exploded view of the foot means of the embodiment of Figure 4, and

Figure 6 shows the foot means of Figure 5 attached to the underside of the pallet.

10

Figures 1 to 3 show a pallet 1 having a rectangular deck 3 formed from chipboard of a suitable thickness and hence strength to carry the desired weight. In the embodiment the board is water-repellent and is 15mm thick and measures 1m x 1.2m. The skilled person will appreciate that it is possible to use other high-density particle board to form the deck 3 as a one-piece unit, or to use conventional timber planks to form the deck 3.

15

On the underside of the deck 3, feet 5 are arranged to provide support for the pallet 1 when loaded with goods. Each foot 5 is formed from a hexagonal shape wooden block having a length of more than treble its width. In the embodiment the blocks are formed from timber having a height of 95mm, a width of 95mm and a length (measured from vertex to vertex) of 300mm. The feet are arranged at the corners of the deck 3 with their respective longitudinal axes (i.e. lengths) lying along the respective diagonal of the rectangular deck 3.

20

25

A central rectangular timber block 7 of the same height (95mm) as the blocks is provided at the centre of the underside of the deck 3 so that its sides lie in line with the longitudinal sides of the hexagonal feet 5. Optional diagonally arranged stringers 11 are provided on the underside of the deck between the deck 3 and the feet 5 to provide additional strength to the pallet. In the embodiment, the pallet 1 is believed to be capable of supporting loads of up to 1.5 tonnes.

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It will be noted that the pallet does not, in most cases, require conventional base boards and because of the one-piece deck 3 and limited number of supporting blocks, the pallet 1 is economical to manufacture since it uses few parts which may be quickly and simply assembled.

The one-piece chipboard deck 3 has the advantage that its smooth upper surface prevents damage to the load, and because of its low moisture content products which may be damaged by moisture, such as paper, can be transported on pallet 1 without damage.

The shape and arrangement of the supporting feet 5 is an important feature of the present invention.

In particular, the location of the feet at the corners of the deck enables access by a fork-lift truck from the four sides of the pallet as in conventional four-way entry timber pallets. Furthermore, because the feet are long and narrow and angled to the sides of the pallet, entry by a fork-lift truck is possible from the corners of the pallet. Thus, a fork-lift truck can approach a corner of the pallet with a fork either side of the corner foot 5 and enter underneath the pallet with the forks substantially parallel to the longitudinal sides of the corner foot 5. The hexagonal shape of the feet 5 is designed to guide the lifting forks into position either side of the corner foot. Thus, if the pallet is approached from a corner, the corner foot 5 will deflect the lifting fork into a position parallel to its sides.

The length and angle of the corner feet on the pallet has further advantages in enabling the pallet to be readily placed on beam racking of a variety of sizes. This is because the feet span a substantial distance along the length/width of the pallet 1. The feet 5 must be placed on the beams of the racking so that a space is formed beneath the deck 3 for fork access. Thus, referring to Figure 3, the pallets can be racked end-on having a spacing of between X and Y as illustrated in Figure 3. It will be appreciated that the pallets can similarly be

racked side-on on racking having a similarly wide range of spacings.

Furthermore, it will be appreciated that this arrangement of feet means that the pallet can be racked without the need for baseboards.

5 However, baseboards can be provided with these pallets and when provided it is preferred to provide stringer-shaped baseboards which extend diagonally on the underside of the deck between diagonally opposite corner feet 5.

10 It will be understood that the same advantages could be obtained by using several spaced blocks to form each corner foot. The additional labour costs for assembling the extra blocks would be compensated for by the reduction in material quantity.

15 Figure 4 shows a pallet forming a second embodiment of the present invention in which features corresponding to the features of the first embodiment have been given like reference numerals.

20 In this embodiment, the pallet 1 has a rectangular deck 3 formed from a plastics material. The skilled person will appreciate that the deck can be formed of any suitable polymeric material as is well known in the art.

25 The deck 3 has four generally rectangular shaped feet 5 on its underside to provide support for the pallet when loaded. The feet 5 are located at the corners of the deck with their respective lengths lying along the respective diagonal of the deck in the same way as the feet of the first embodiment. Thus the arrangement of the feet in this embodiment provides the same advantages as those described in relation  
30 to the first embodiment. In this embodiment the ends of the feet 5 are chamfered.

As is known in the art, the plastics deck 3 is moulded in a ribbed or reticular structure so as to provide a sufficiently rigid platform to  
35 support the load and prevent flexure and bowing of the deck whilst at

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the same time using a minimum quantity of plastics material.

In addition, extra support may be required (to avoid 'point loading' problems associated with stacking loaded pallets) on the underside of the deck. Such support could be provided in the form of a central transverse support extending parallel to the sides of the deck. The skilled person will understand that a further central support could be provided extending perpendicular to the first support so as to form a cross-shaped support on the underside of the deck.

10

The feet 5 are removably secured to the underside of the deck 3 as shown in Figures 5 and 6. The feet 5 comprise moulded reticular plastics blocks 5a which have plugs 17 which push fit into complementary sockets 19 moulded within the underside of the deck 3. A resilient latch arrangement 21 secures the feet on the underside of the deck. It will be understood that any method of releasably fastening the feet 5 to the deck 3 may be used and the illustrated method is merely exemplary. The feet 5 additionally each have a cover 5b of a hard wearing plastics or other material which can be releasably fastened over the blocks 5a (in the same way as the blocks 5a are fastened to the deck 3) to protect the feet from wear. It is envisaged that the number of socket mouldings could be provided at each corner on the underside of the deck so that the feet could be secured with their respective lengths one of a number of different angles relative to a side of the deck. For instance the feet could be arranged at one of 30°, 45° and 60° to a side of the deck.

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The position the pallet of the second embodiment would take on racking of the two conventional spacings is illustrated in figure 4 in dashed lines.

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An advantage of the feet 5 being removable from the deck is that they can be replaced if damaged. The feet need not be plastics but it is economical to use plastics since the feet contain relatively little material. The upper surface of the deck may be provided with a smooth

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cover which may be permanently or releasably secured onto the deck.

5 Pallets made according to the described embodiments are 'nestable' so that they can be stacked one upwards, one downwards with the boards slightly out of line so that the space between the stacked pallets is minimised. In this way, it is possible to stack a far larger quantity of pallets in a given space such as in a vehicle for transport of the unloaded pallets.

10 Various modifications may be made to the described embodiment and it is intended to include all such variations and modifications that fall within the scope of the accompanying claims.

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CLAIMS

1. A pallet comprising a deck having foot means secured to its underside at or immediately adjacent each of its corners wherein each  
5 foot means has a length longer than its width and the length extends at an acute angle to the adjacent peripheral edges of the deck.
2. A pallet as claimed in claim 1, wherein the length of each foot means is angled to one peripheral edge of the deck at an angle within  
10 the range of 10° to 45°.
3. A pallet as claimed in claim 1 or claim 2, wherein the deck is rectangular and the length of each foot means extends substantially diagonally.  
15
4. A pallet as claimed in any preceding claim in which the length of each foot means is its maximum length.
5. A pallet as claimed in claim 4 in which the width of each foot means is the maximum width extending at 90° to the length of said foot means.  
20
6. A pallet as claimed in any preceding claim, wherein the foot means are releasably fastened to the underside of the deck.  
25
7. A pallet as claimed in claim 6, wherein the foot means and deck have complementary engagement means for releasably fastening the foot means to the underside of the deck.
8. A pallet as claimed in claim 7, in which the deck has a plurality of engagement means at or immediately adjacent each of its corners to engage and retain foot means at one of a corresponding plurality of acute angles to one peripheral edge of the deck.  
30
9. A pallet as claimed in any preceding claim, wherein each foot  
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means is a single block.

10. A pallet as claimed in claim 9, wherein an end of each foot means is chamfered or tapered.

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11. A pallet as claimed in any one of claims 1 to 8, wherein each foot means comprises two or more blocks.

12. A pallet as claimed in any preceding claim, wherein the deck is  
10 formed from timber planks.

13. A pallet as claimed in any one of claims 1 to 11, wherein the deck is formed from plastics material.

15 14. A pallet as claimed in any preceding claim, wherein each foot means has a removable protective cover.

15. A pallet as claimed in any preceding claim, wherein the upper  
surface of the deck has a removable protective cover.

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16. A pallet substantially as herein before described with reference to, and as shown in, Figures 1, 2 and 3 or Figures 4, 5 and 6 or Figure 7 of the accompanying drawings.

<b>Patents Act 1977</b> <b>Examiner's report to the Comptroller under Section 17</b> <b>(The Search report)</b>	10 Application number GB 9506865.6
<b>Relevant Technical Fields</b>  (i) UK Cl (Ed.N)      B8H (HLC, HQG, HQH, HQJ) (ii) Int Cl (Ed.6)      B65D  <b>Databases (see below)</b> (i) UK Patent Office collections of GB, EP, WO and US patent specifications.  (ii)	Search Examiner D McMUNN
	Date of completion of Search 11 AUGUST 1995
	Documents considered relevant following a search in respect of Claims :- 1-16

**Categories of documents**

<b>X:</b> Document indicating lack of novelty or of inventive step.	<b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.
<b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.	<b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.
<b>A:</b> Document indicating technological background and/or state of the art.	<b>&amp;:</b> Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1579430 (GREEN) see Figure 1	1-6, 13
X	GB 1575458 (GEMVIK) note feet 1	1-2, 4-5, 9 12
X	GB 1571190 (WAVIN) see Figure 2 (one example of a number of this type)	1-2, 13
X	GB 1425888 (STAPLA) note spacers 15	1, 2, 4, 5 9. 12
X	US 5231934 (GOOD) note legs 12	1-5, 11

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).